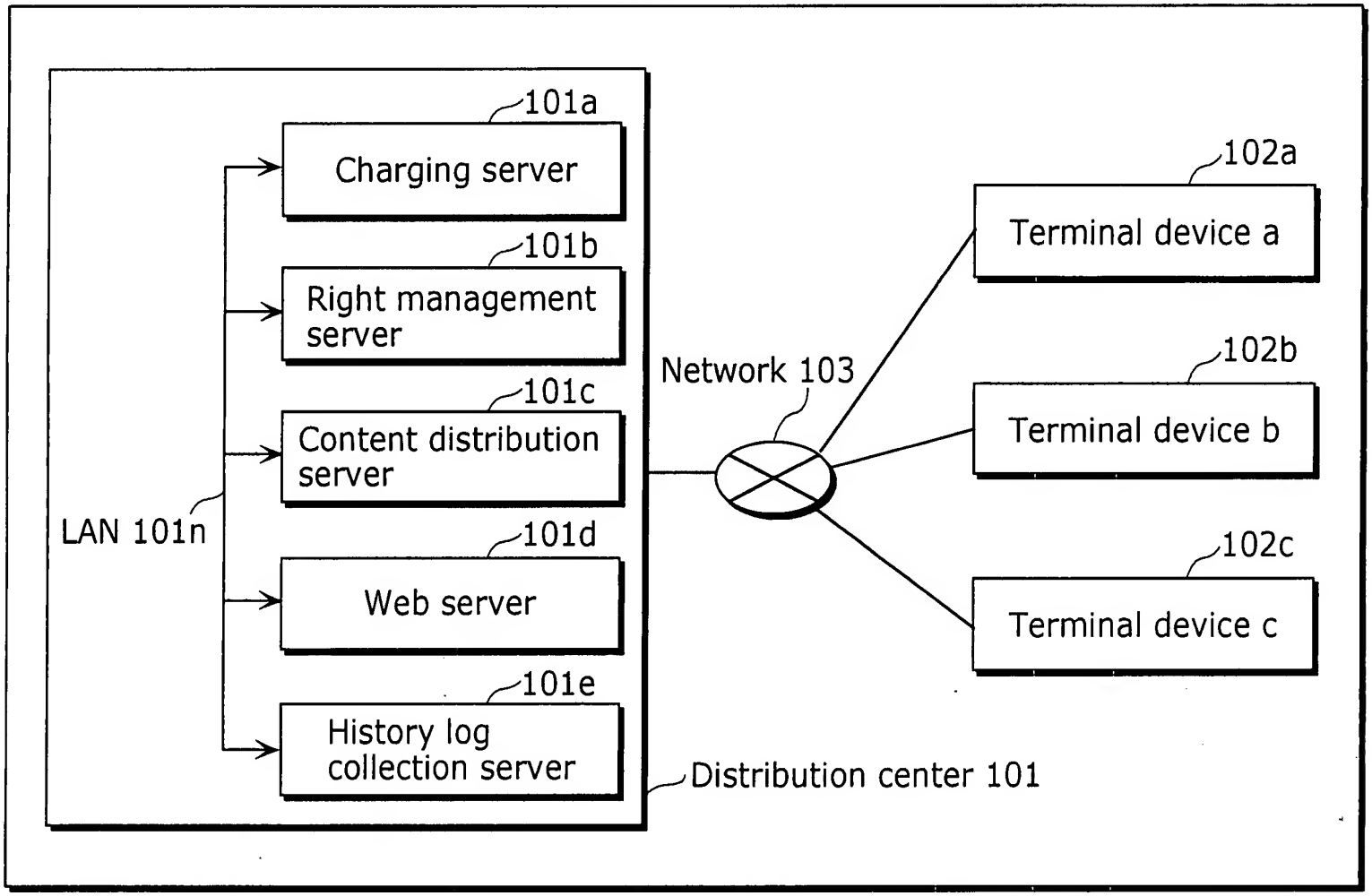
FIG. 1



Content history log collecting system 1

FIG. 2

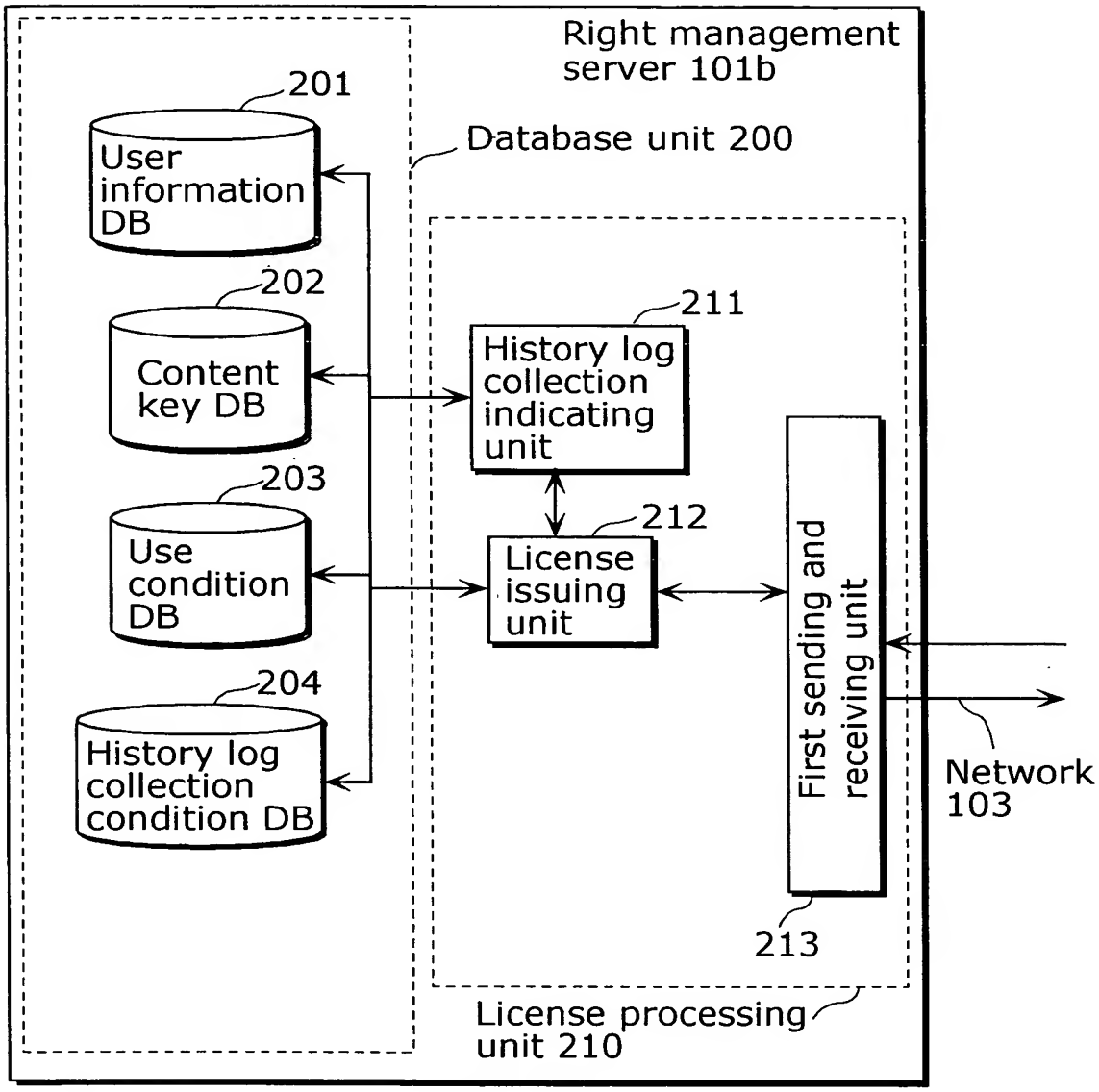

Right management server 101b
201
User information DB
Database unit 200
202
Content key DB
211
History log collection indicating unit
203
Use condition DB
212
License issuing unit
204
History log collection condition DB
First sending and receiving unit
Network 103
213
License processing unit 210

FIG. 3

301 User ID	302 Terminal ID	303 User profile	304 Privacy policy
USER-ID-00001	TERMINAL-ID-00001	Man, 31 years old, ...	Detailed history log collecting OK
USER-ID-00002	TERMINAL-ID-12345 TERMINAL-ID-54321	Woman, 24 years old, ...	History log collecting OK
USER-ID-00003	TERMINAL-ID-77777	Woman, 18 years old, ...	History log collecting OK
USER-ID-00004	TERMINAL-ID-99999	Man, 42 years old, ...	History log collecting NG
...	...	...	...

User information management table 300

FIG. 4

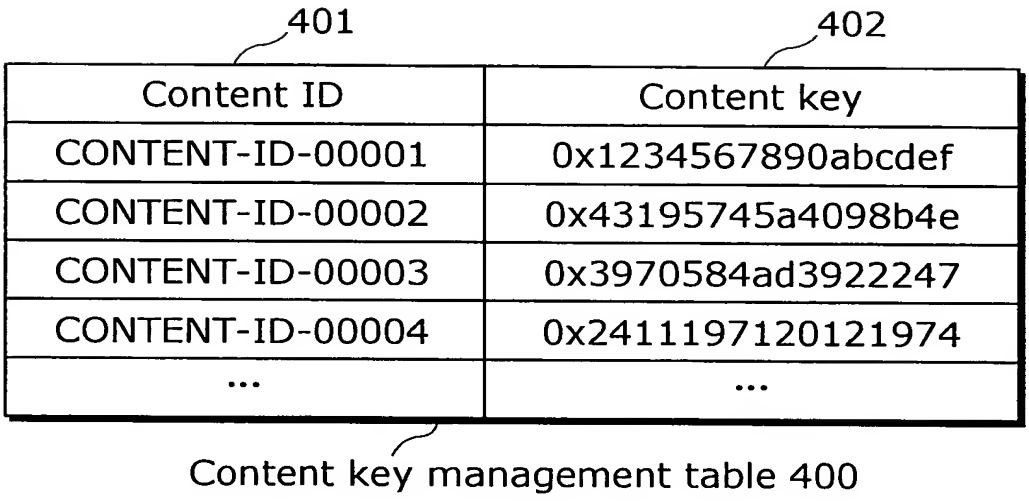

401
402
Content ID
Content key
CONTENT-ID-00001
0x1234567890abcdef
CONTENT-ID-00002
0x43195745a4098b4e
CONTENT-ID-00003
0x3970584ad3922247
CONTENT-ID-00004
0x2411197120121974
...
...
Content key management table 400

FIG. 5

501 User ID	502 Use condition ID	503 Content ID	504 Validated period	505 Available frequency
USER-ID-00001	URUs-ID-00001	CONTENT-ID-00001	2002/12/31~2003/1/30	∞
USER-ID-00002	URUs-ID-00002	CONTENT-ID-13452	2002/12/1~2002/12/31	5
USER-ID-00002	URUs-ID-10011	CONTENT-ID-99999	∞	1
USER-ID-00003	URUs-ID-24024	CONTENT-ID-02804	2002/11/24~2002/12/20	∞
...	...	...	...	...

Use condition management table 500

FIG. 6

History log collection condition 602

601 Content ID	603 Target user determination condition	604 History log record condition	605 History log description	606 History log response condition
CONTENT-ID-00001	At random	For each content	Action, Time	5:00 o'clock everyday
CONTENT-ID-00002	All user	For each user operation special playback included	Used part	For each user operation
CONTENT-ID-00003	Privacy policy	For each user operation special playback excluded	Action, Time, Used part	Immediately after using content
CONTENT-ID-00004	10 or more user rights	For each content	Action, Time	When sending LT
...	...	...	...	...

History log collection condition management table 600

FIG. 7

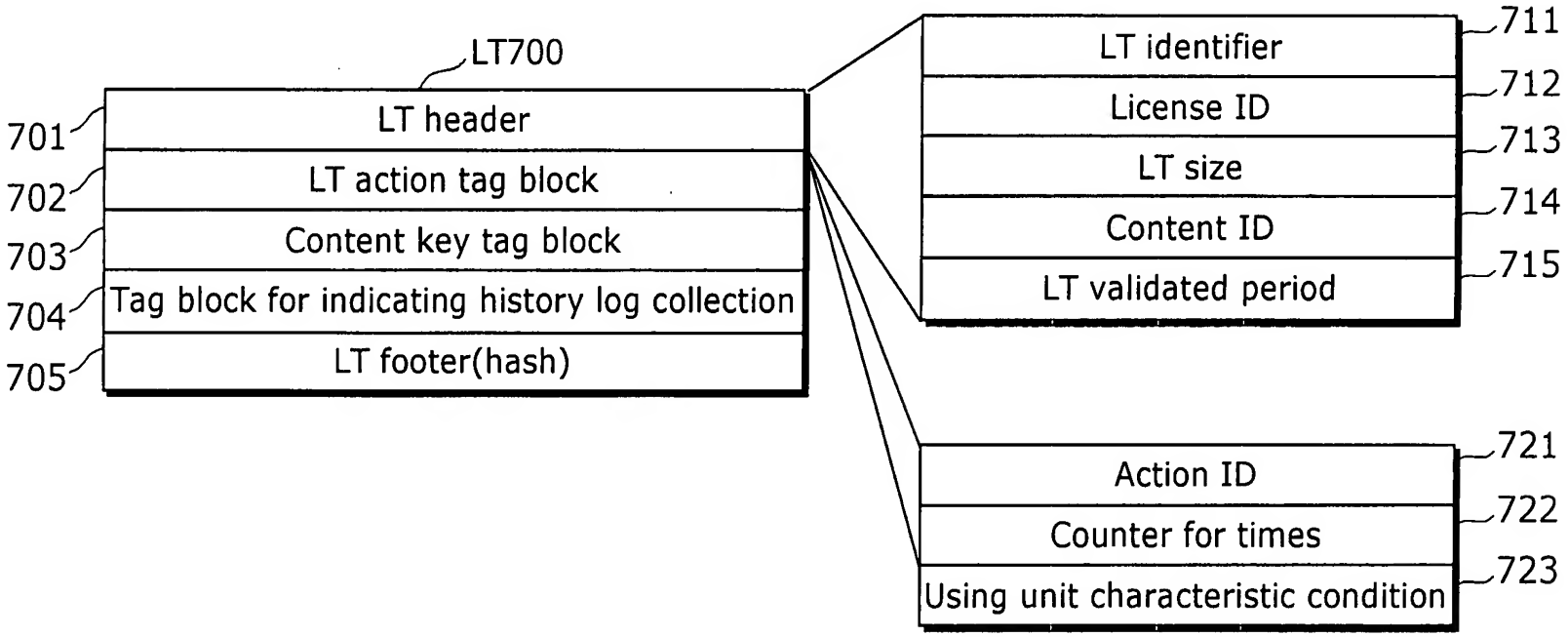

LT700
701
LT header
702
LT action tag block
703
Content key tag block
704
Tag block for indicating history log collection
705
LT footer(hash)
LT identifier
License ID
LT size
Content ID
LT validated period
711
712
713
714
715
Action ID
Counter for times
Using unit characteristic condition
721
722
723

FIG. 8

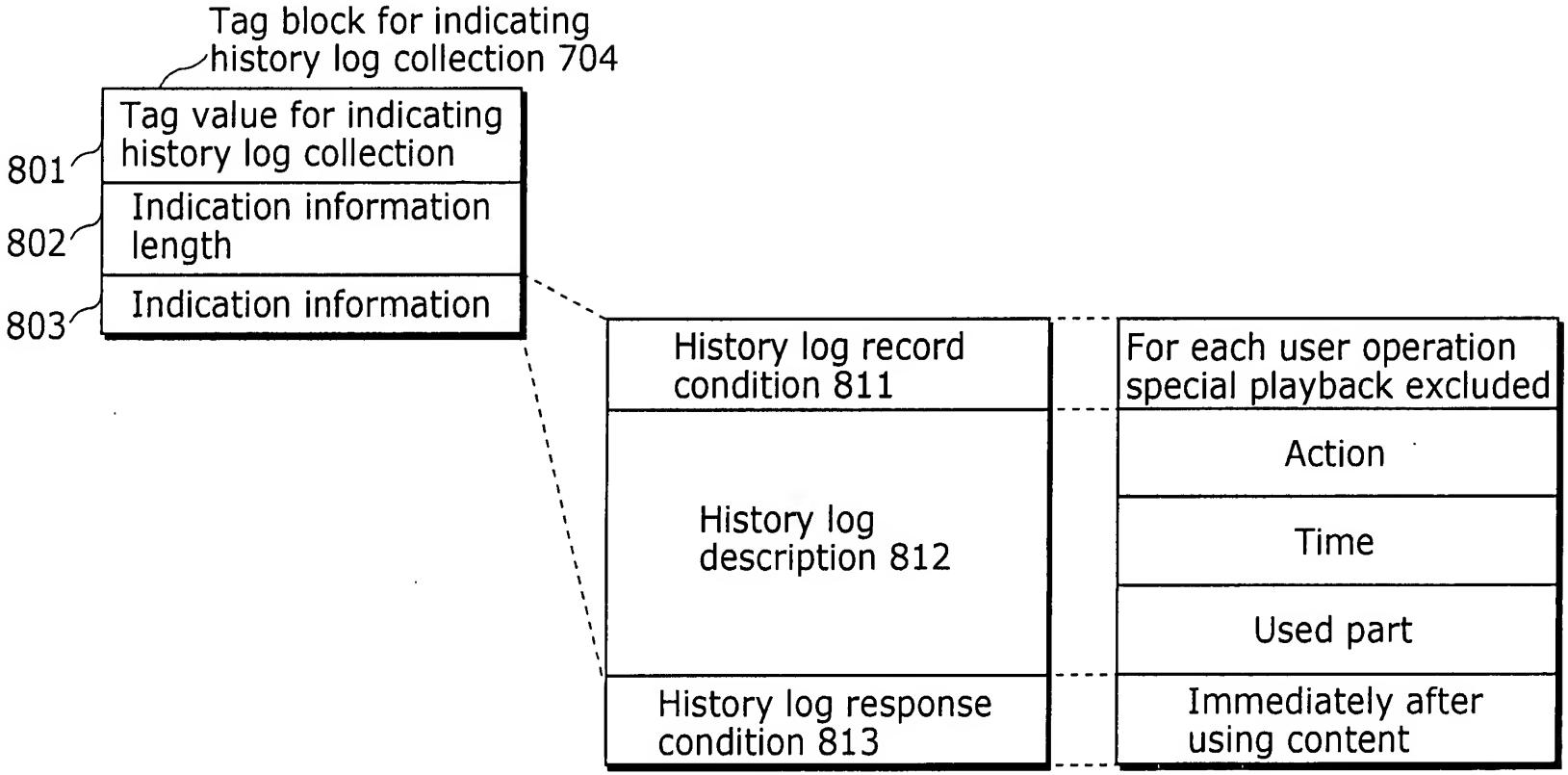

Tag block for indicating history log collection 704
Tag value for indicating history log collection
801
Indication information length
802
Indication information
803
History log record condition 811
For each user operation special playback excluded
History log description 812
Action
Time
Used part
History log response condition 813
Immediately after using content

FIG. 9

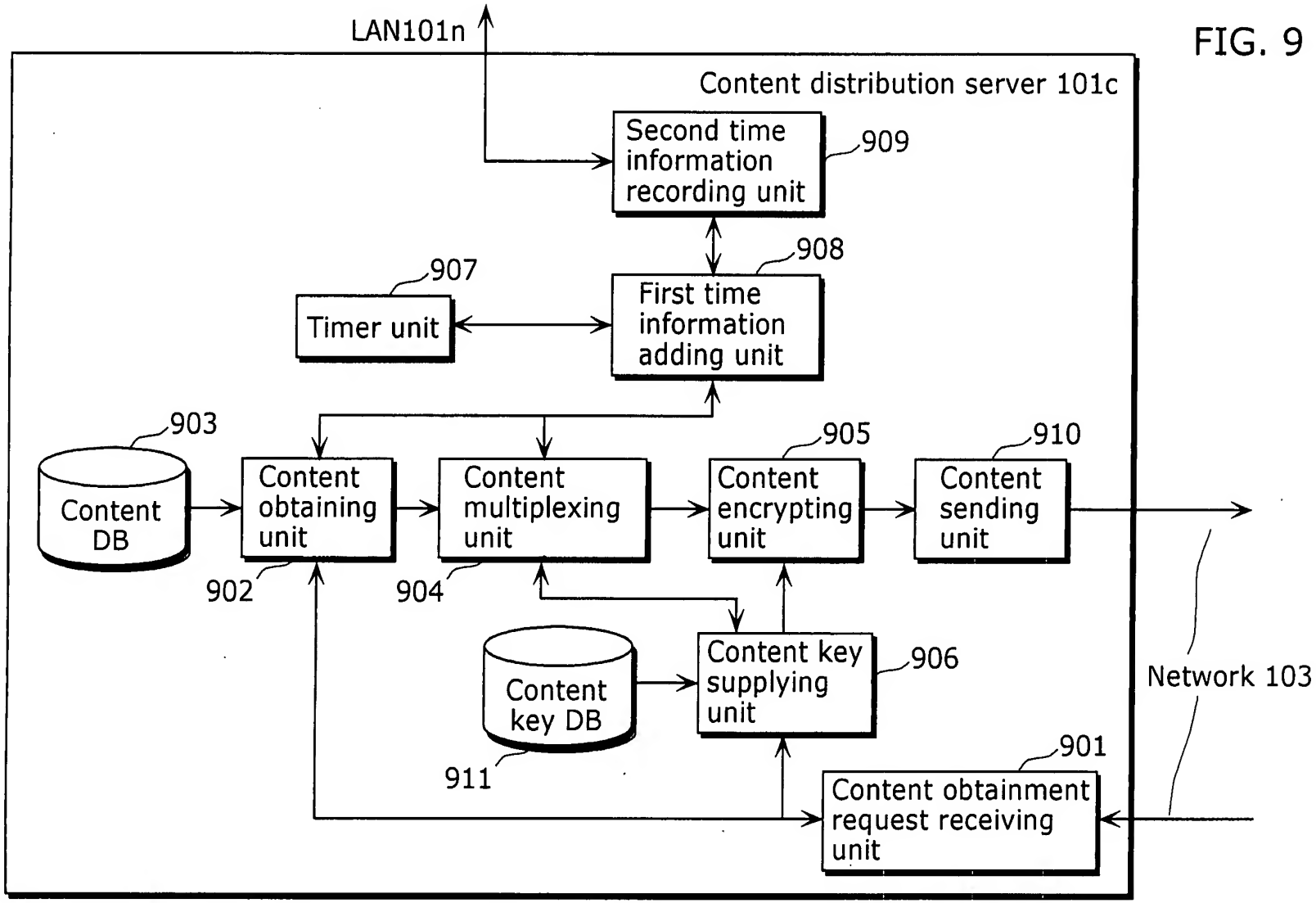

LAN101n
Content distribution server 101c
Second time information recording unit
909
908
First time information adding unit
907
Timer unit
903
Content DB
Content obtaining unit
902
Content multiplexing unit
904
905
Content encrypting unit
910
Content sending unit
Network 103
Content key DB
911
Content key supplying unit
906
901
Content obtainment request receiving unit

FIG. 10

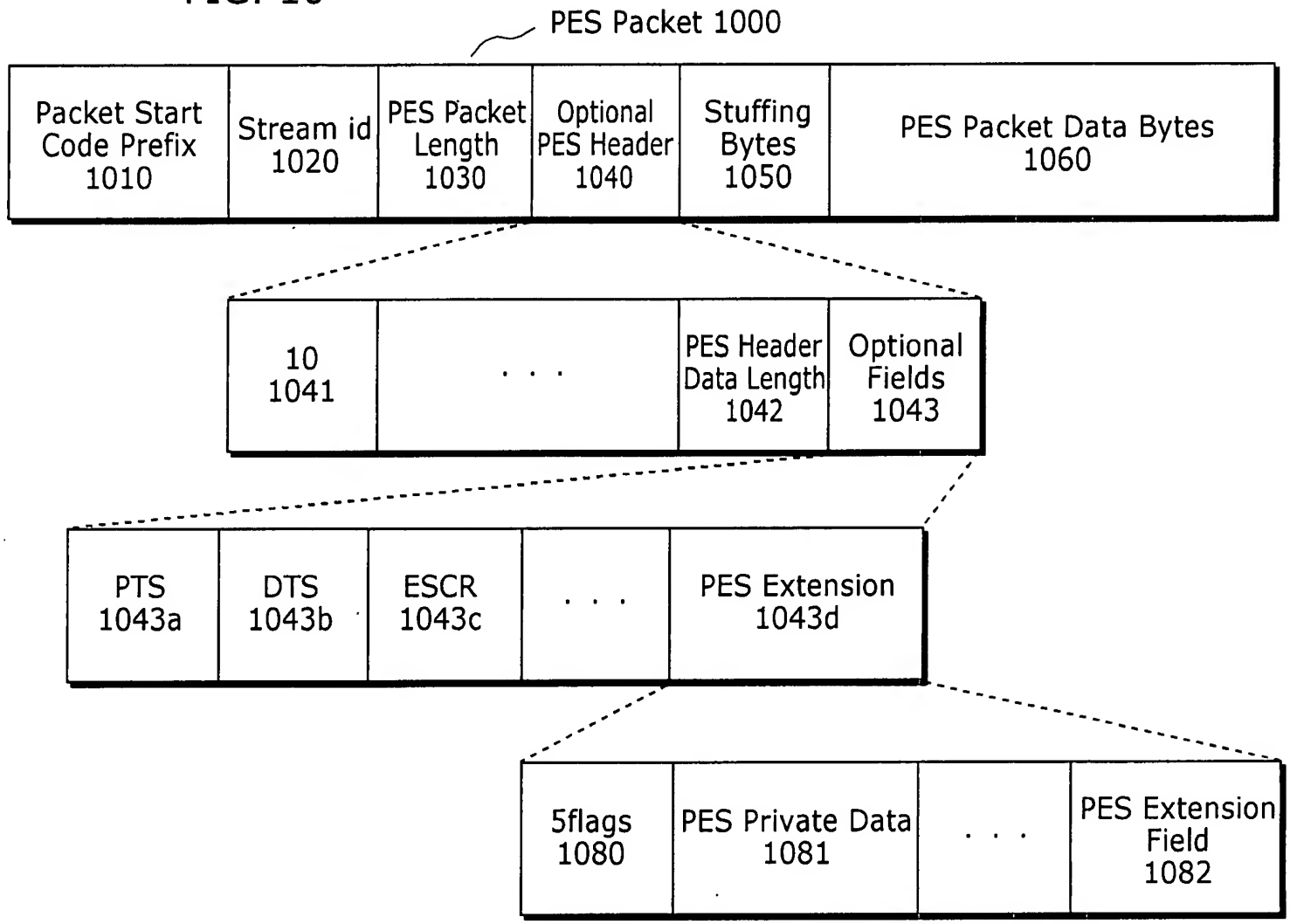

PES Packet 1000
Packet Start Code Prefix 1010
Stream id 1020
PES Packet Length 1030
Optional PES Header 1040
Stuffing Bytes 1050
PES Packet Data Bytes 1060
10 1041
. . .
PES Header Data Length 1042
Optional Fields 1043
PTS 1043a
DTS 1043b
ESCR 1043c
. . .
PES Extension 1043d
5flags 1080
PES Private Data 1081
. . .
PES Extension Field 1082

FIG. 11

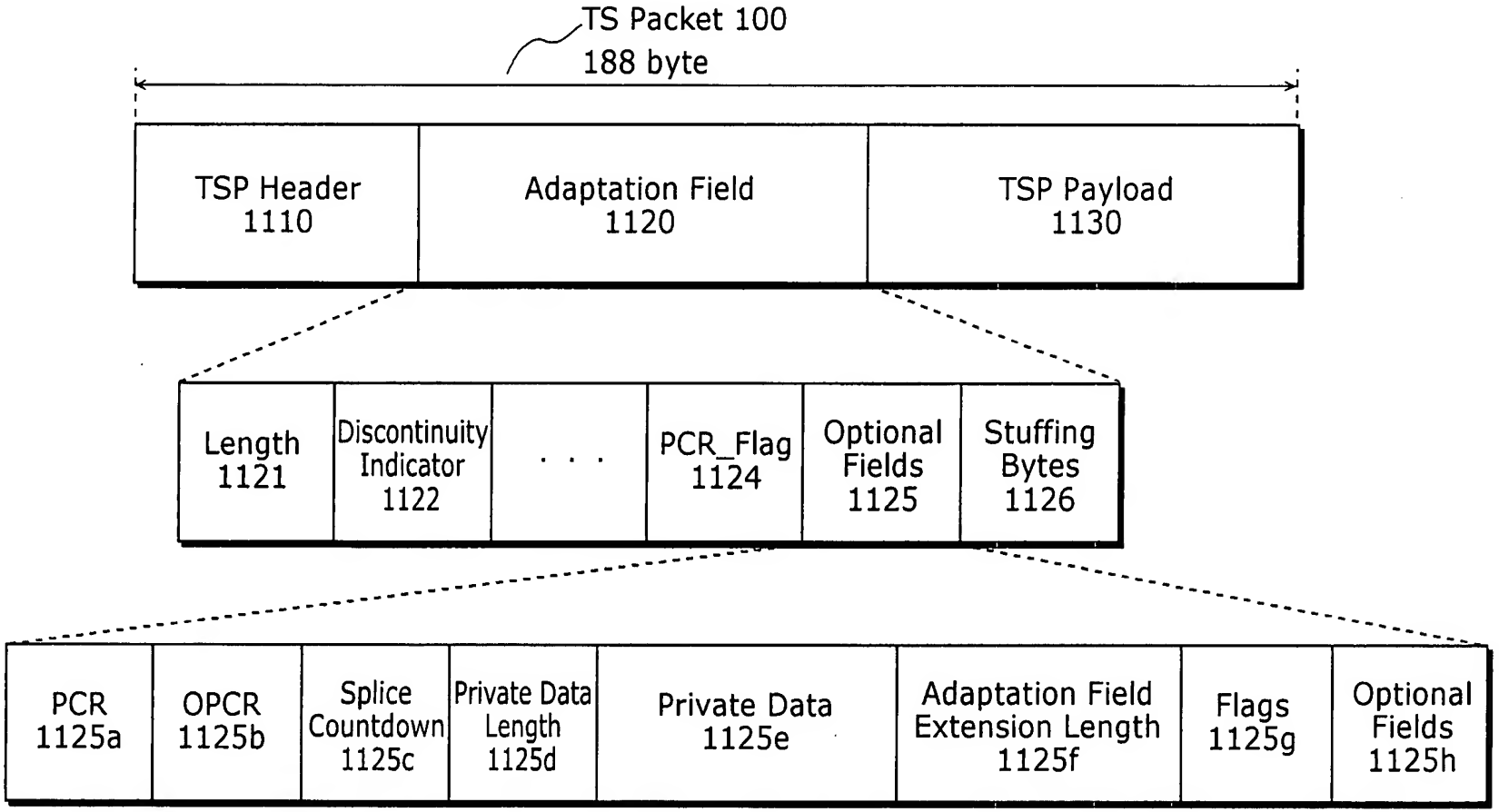

TS Packet 100
188 byte
TSP Header 1110
Adaptation Field 1120
TSP Payload 1130
Length 1121
Discontinuity Indicator 1122
. . .
PCR_Flag 1124
Optional Fields 1125
Stuffing Bytes 1126
PCR 1125a
OPCR 1125b
Splice Countdown 1125c
Private Data Length 1125d
Private Data 1125e
Adaptation Field Extension Length 1125f
Flags 1125g
Optional Fields 1125h

FIG. 12

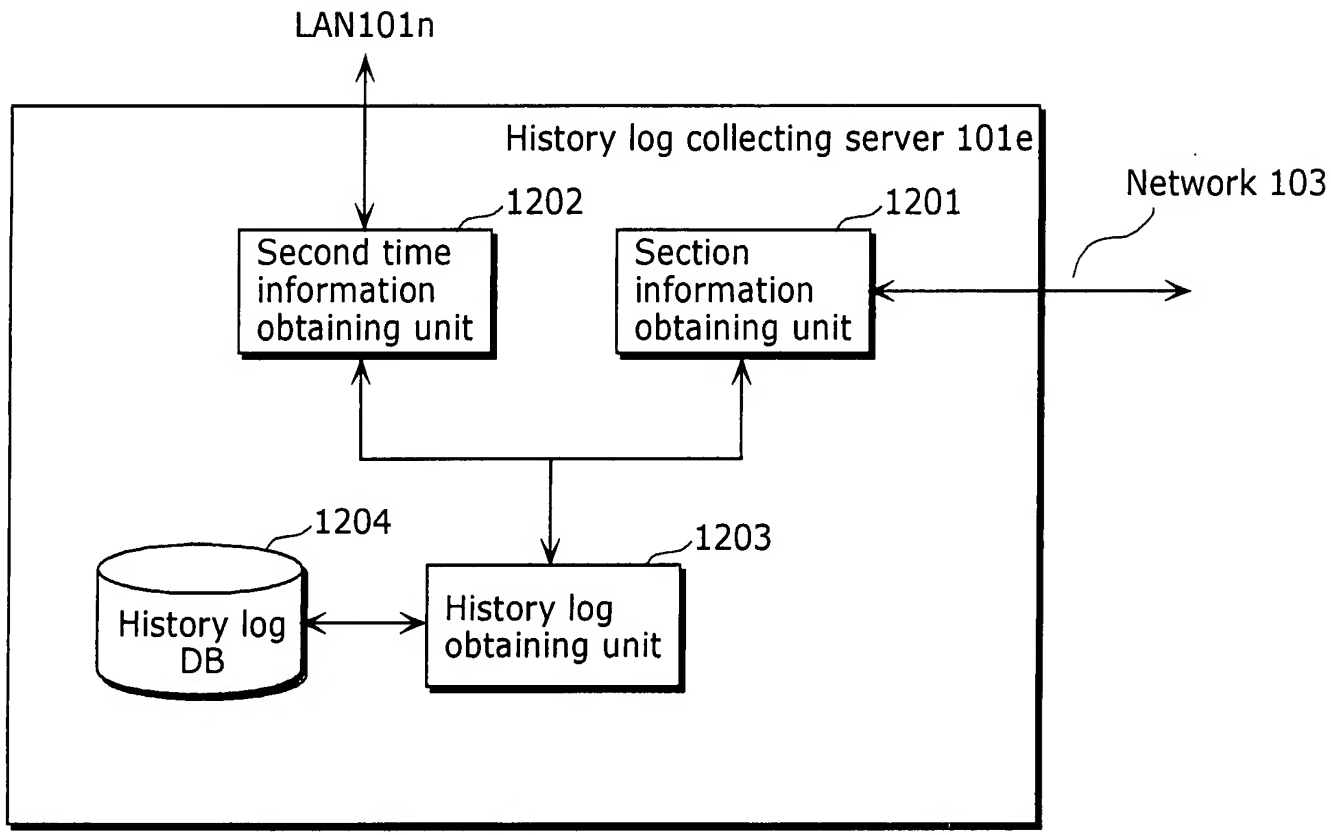

LAN101n
History log collecting server 101e
Network 103
1202
Second time information obtaining unit
1201
Section information obtaining unit
1204
History log DB
1203
History log obtaining unit

FIG. 13

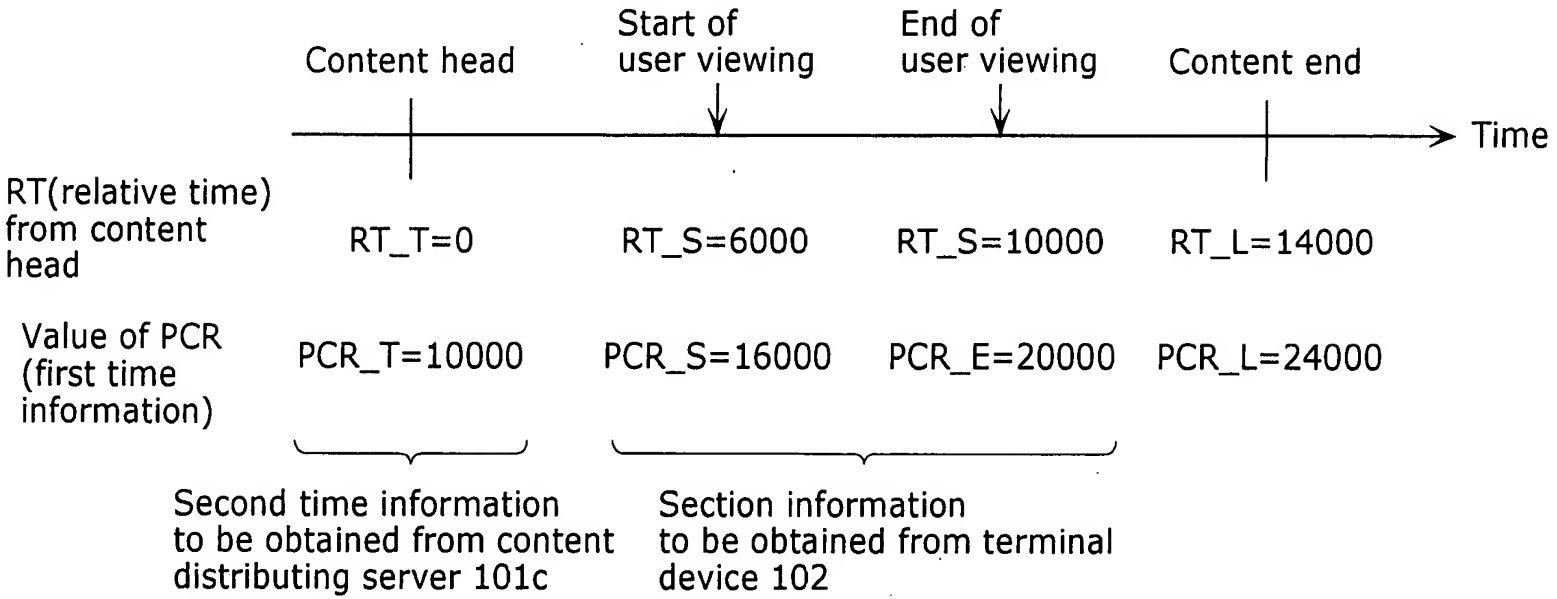
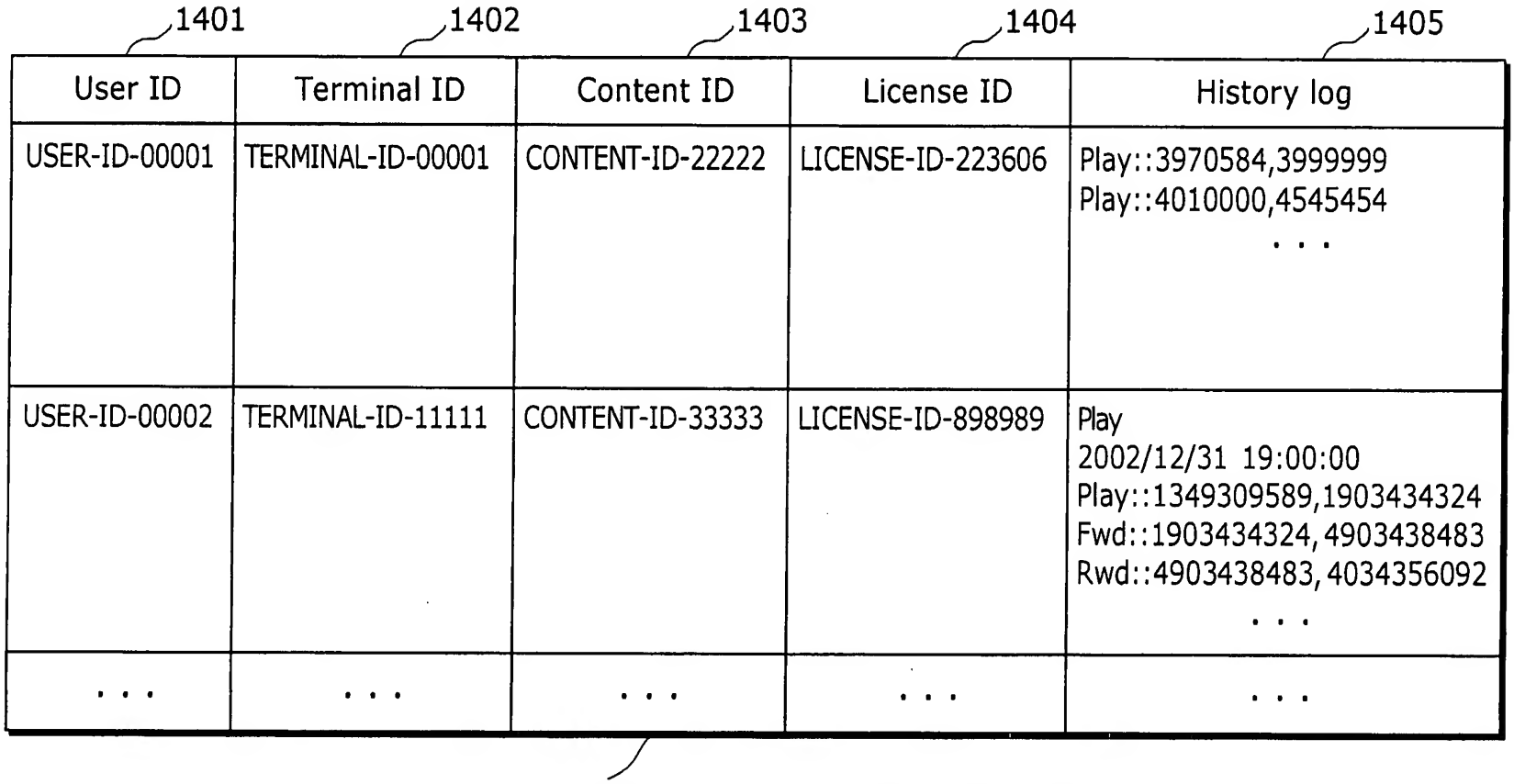

Content head
Start of user viewing
End of user viewing
Content end
Time
RT(relative time) from content head
RT_T=0
RT_S=6000
RT_S=10000
RT_L=14000
Value of PCR (first time information)
PCR_T=10000
PCR_S=16000
PCR_E=20000
PCR_L=24000
Second time information to be obtained from content distributing server 101c
Section information to be obtained from terminal device 102

FIG. 14



1401 User ID	1402 Terminal ID	1403 Content ID	1404 License ID	1405 History log
USER-ID-00001	TERMINAL-ID-00001	CONTENT-ID-22222	LICENSE-ID-223606	Play::3970584,3999999 Play::4010000,4545454 . . .
USER-ID-00002	TERMINAL-ID-11111	CONTENT-ID-33333	LICENSE-ID-898989	Play 2002/12/31 19:00:00 Play::1349309589,1903434324 Fwd::1903434324, 4903438483 Rwd::4903438483, 4034356092 . . .
. . .	. . .	. . .	. . .	. . .

History log management table 1400

FIG. 15

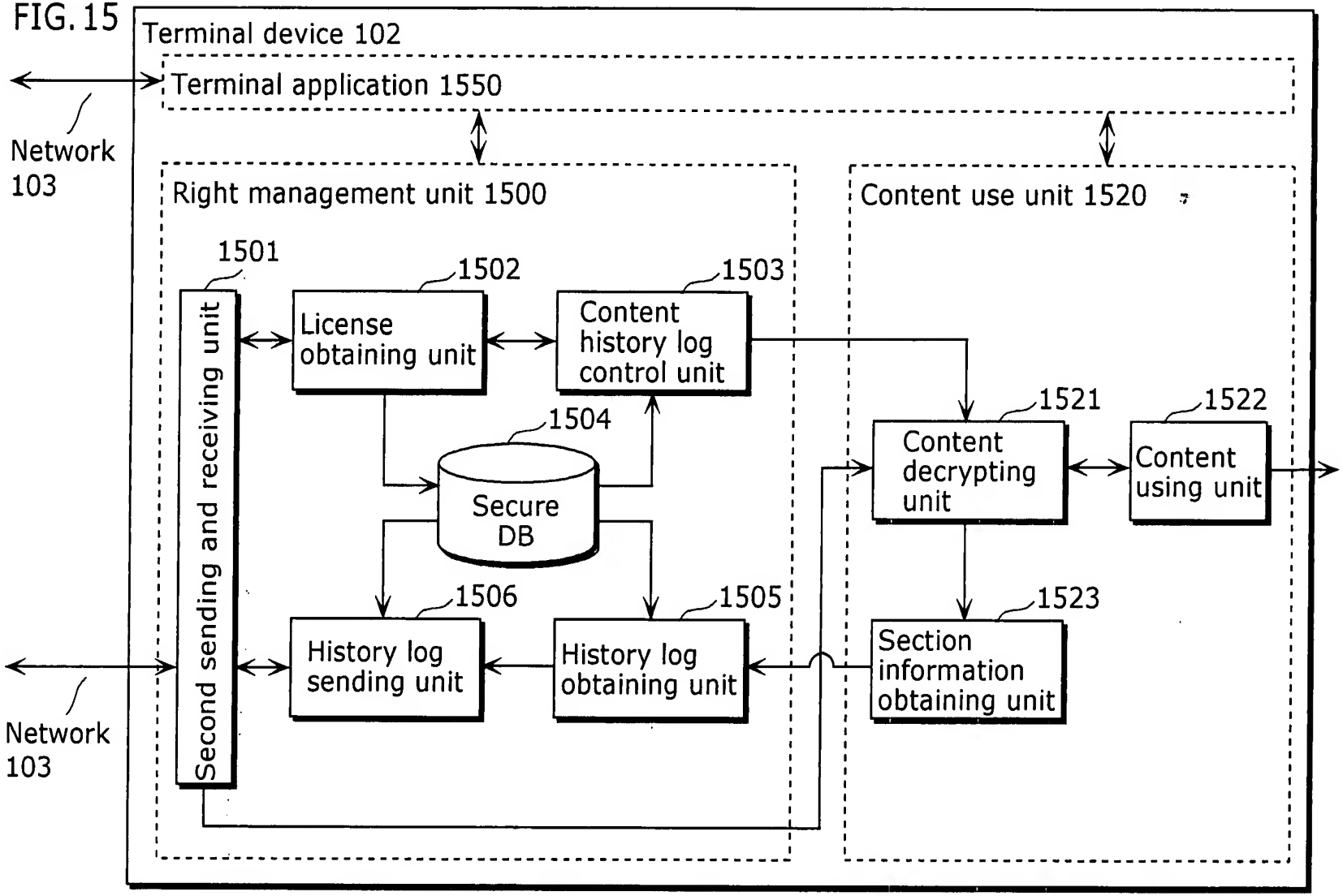

Terminal device 102
Terminal application 1550
Network 103
Right management unit 1500
Content use unit 1520
1501
1502
1503
License obtaining unit
Content history log control unit
1504
Secure DB
1521
1522
Content decrypting unit
Content using unit
1506
1505
1523
History log sending unit
History log obtaining unit
Section information obtaining unit
Second sending and receiving unit
Network 103

FIG. 16

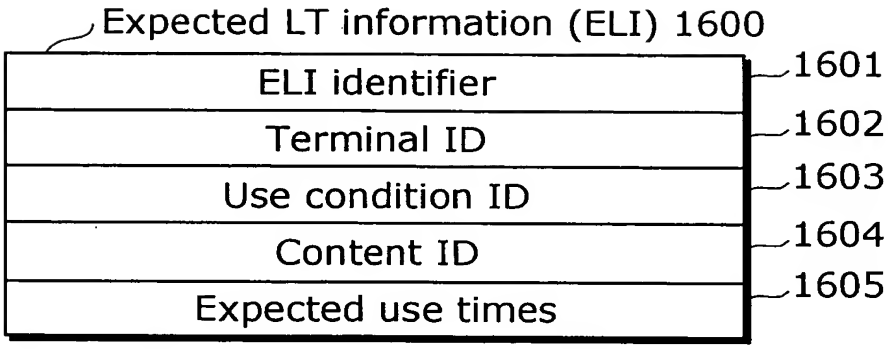

Expected LT information (ELI) 1600
ELI identifier
Terminal ID
Use condition ID
Content ID
Expected use times
1601
1602
1603
1604
1605

FIG. 17

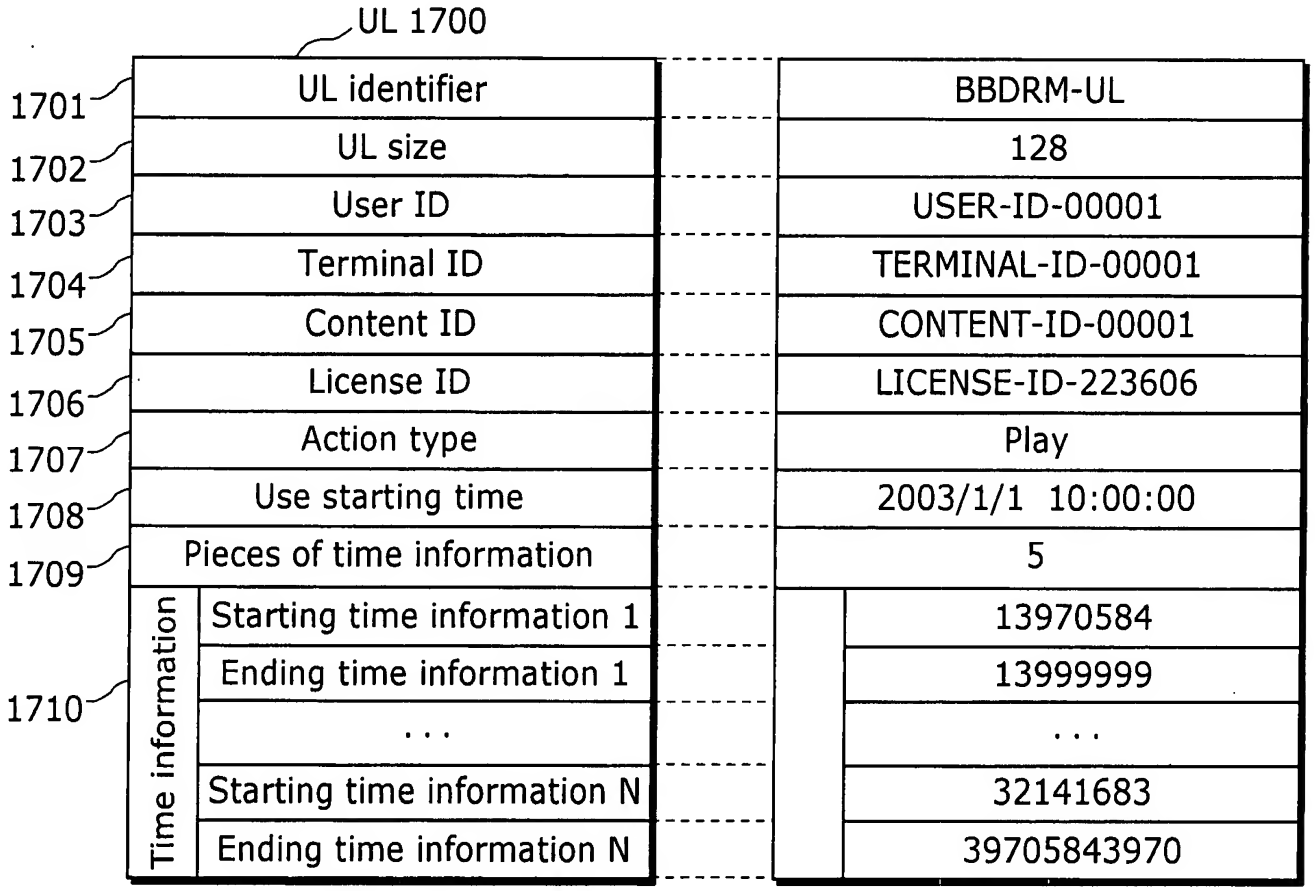

UL 1700
1701
UL identifier
BBDRM-UL
1702
UL size
128
1703
User ID
USER-ID-00001
1704
Terminal ID
TERMINAL-ID-00001
1705
Content ID
CONTENT-ID-00001
1706
License ID
LICENSE-ID-223606
1707
Action type
Play
1708
Use starting time
2003/1/1 10:00:00
1709
Pieces of time information
5
1710
Time information
Starting time information 1
13970584
Ending time information 1
13999999
. . .
. . .
Starting time information N
32141683
Ending time information N
39705843970

FIG. 18

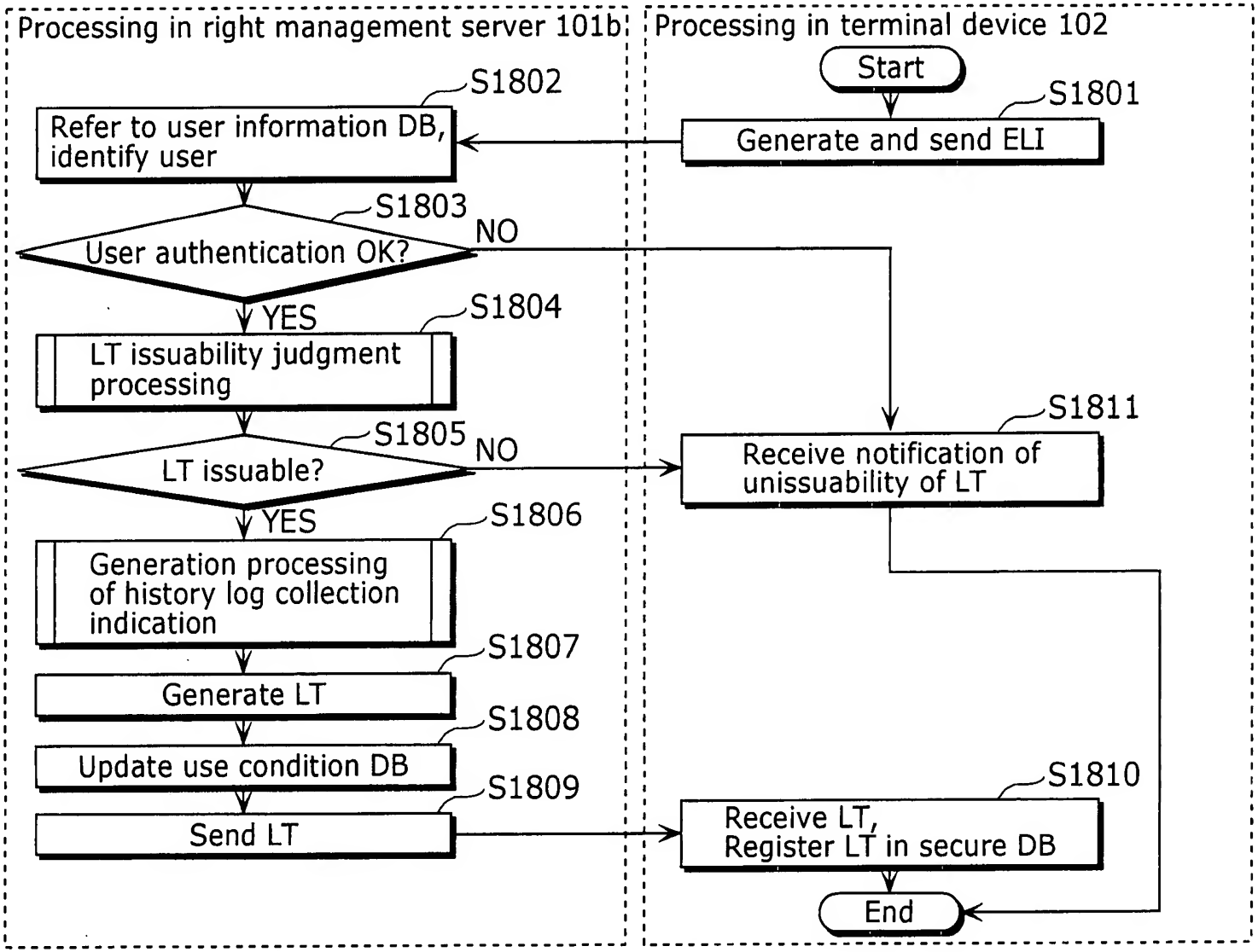

Processing in right management server 101b
Processing in terminal device 102
Start
S1801
Generate and send ELI
S1802
Refer to user information DB, identify user
S1803
User authentication OK?
NO
YES
S1804
LT issuability judgment processing
S1805
LT issuable?
NO
YES
S1806
Generation processing of history log collection indication
S1807
Generate LT
S1808
Update use condition DB
S1809
Send LT
S1811
Receive notification of unissuability of LT
S1810
Receive LT, Register LT in secure DB
End

FIG. 19

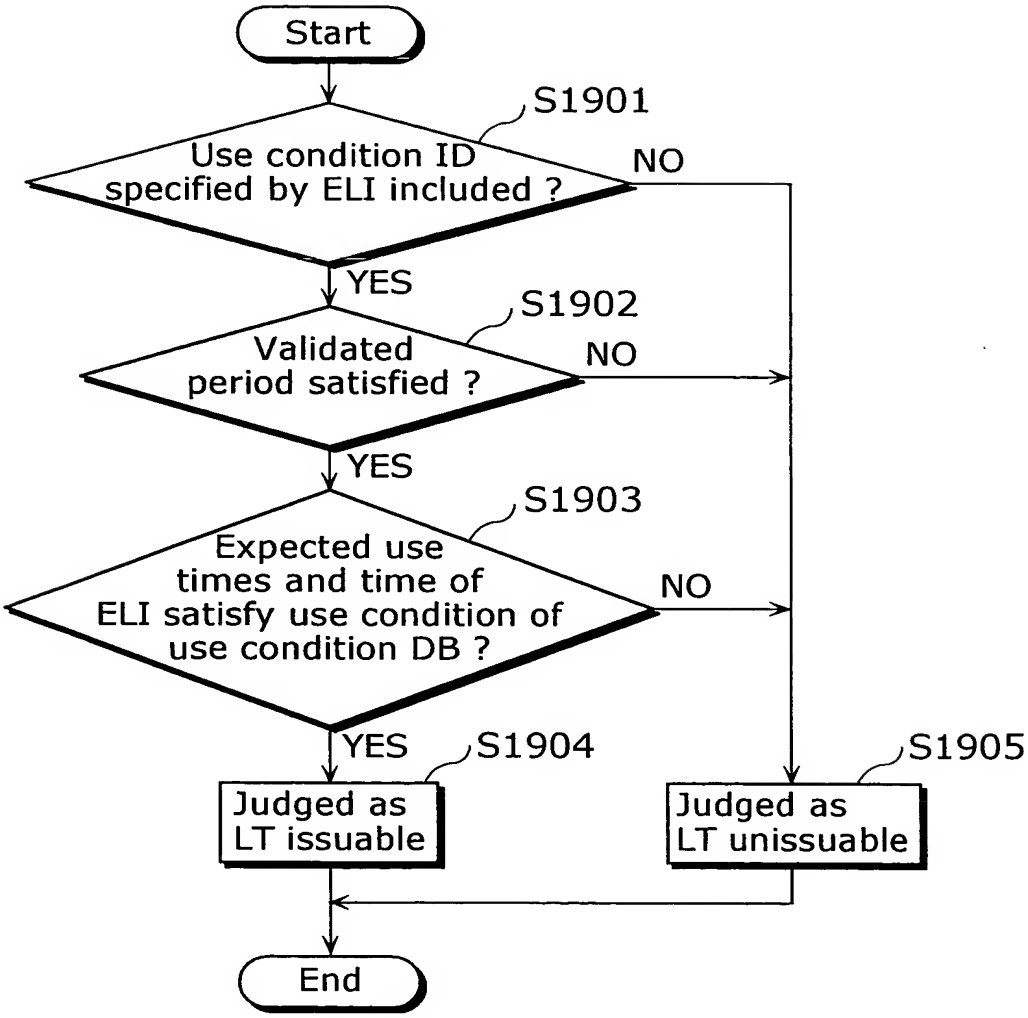

Start
S1901
Use condition ID specified by ELI included ?
NO
YES
S1902
Validated period satisfied ?
NO
YES
S1903
Expected use times and time of ELI satisfy use condition of use condition DB ?
NO
YES
S1904
Judged as LT issuable
S1905
Judged as LT unissuable
End

FIG. 20

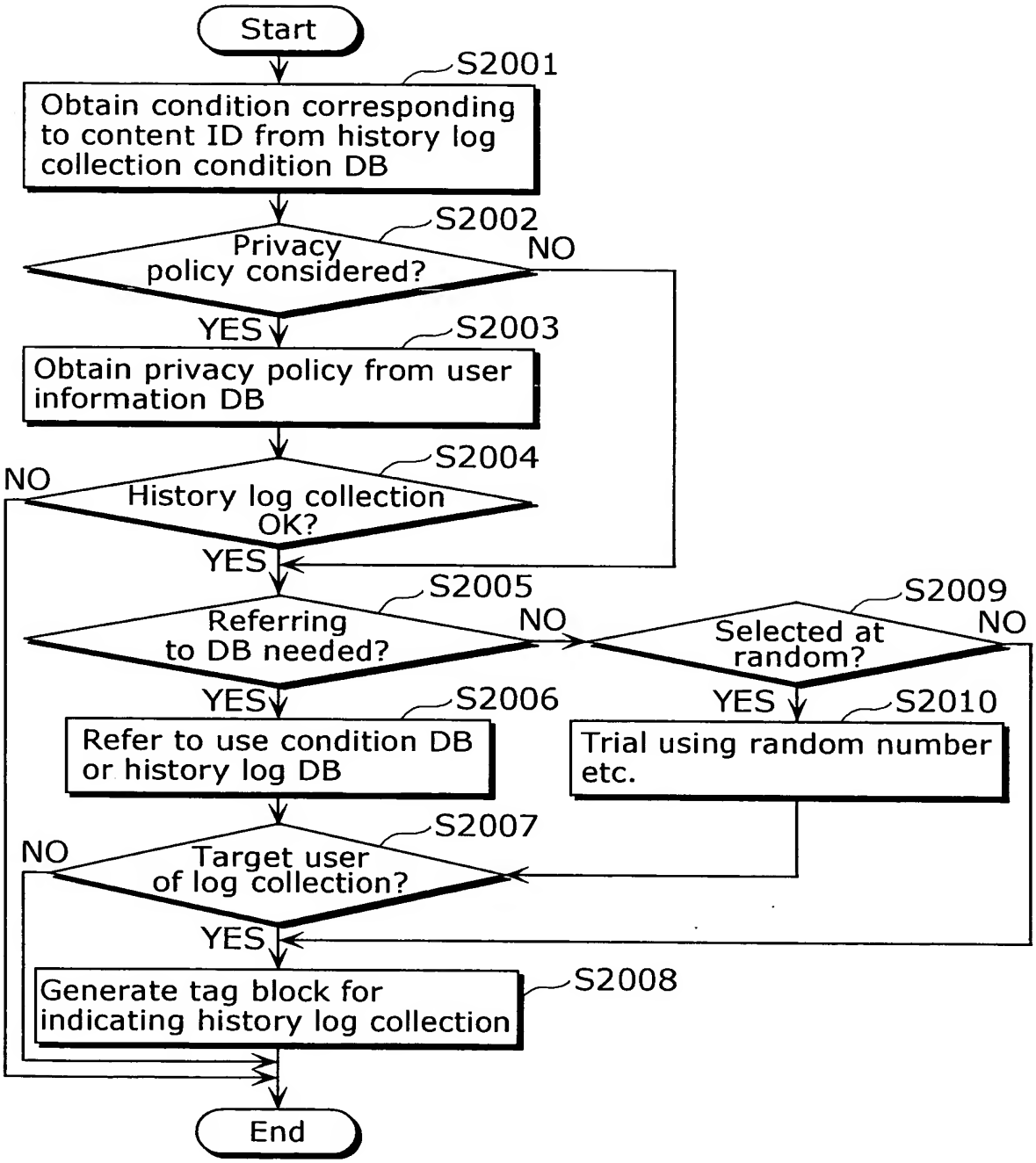

Start
S2001
Obtain condition corresponding to content ID from history log collection condition DB
S2002
Privacy policy considered?
NO
YES
S2003
Obtain privacy policy from user information DB
S2004
NO
History log collection OK?
YES
S2005
Referring to DB needed?
NO
S2009
Selected at random?
NO
YES
S2006
Refer to use condition DB or history log DB
YES
S2010
Trial using random number etc.
S2007
NO
Target user of log collection?
YES
Generate tag block for indicating history log collection
S2008
End

FIG. 21

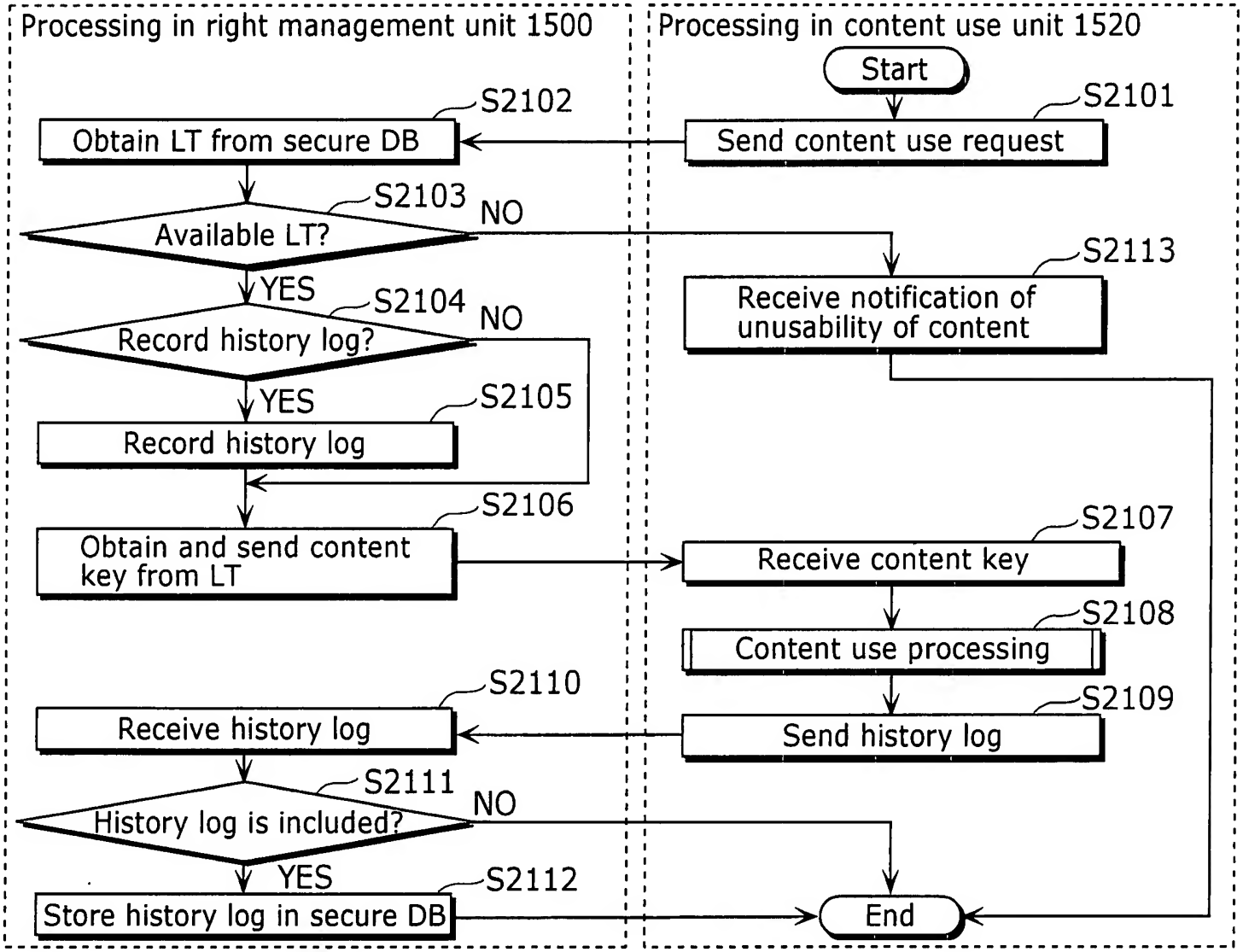

Processing in right management unit 1500
Processing in content use unit 1520
Start
S2101
Send content use request
S2102
Obtain LT from secure DB
S2103
Available LT?
NO
YES
S2113
Receive notification of unusability of content
S2104
Record history log?
NO
YES
S2105
Record history log
S2106
Obtain and send content key from LT
S2107
Receive content key
S2108
Content use processing
S2109
Send history log
S2110
Receive history log
S2111
History log is included?
NO
YES
S2112
Store history log in secure DB
End

FIG. 22

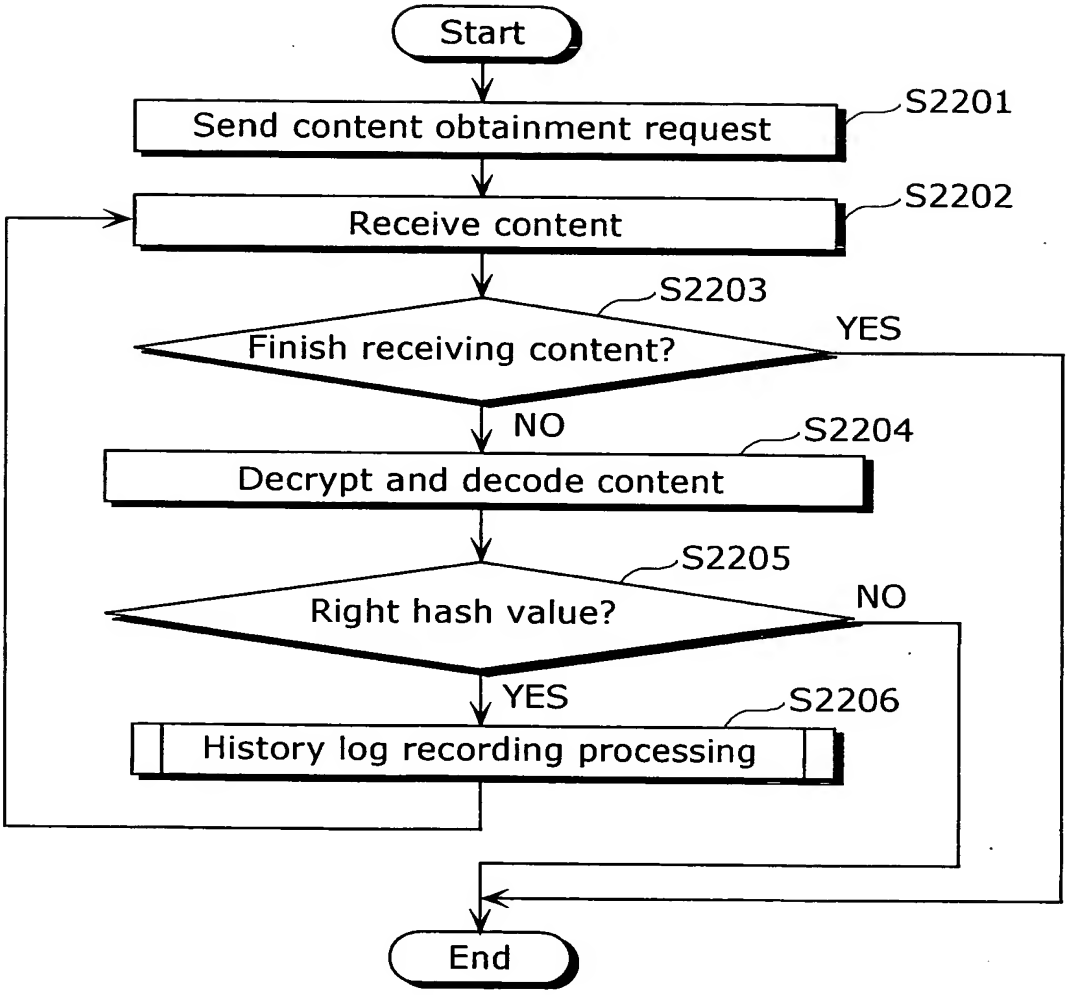

Start
Send content obtainment request
S2201
Receive content
S2202
S2203
Finish receiving content?
YES
NO
S2204
Decrypt and decode content
S2205
Right hash value?
NO
YES
S2206
History log recording processing
End

FIG. 23

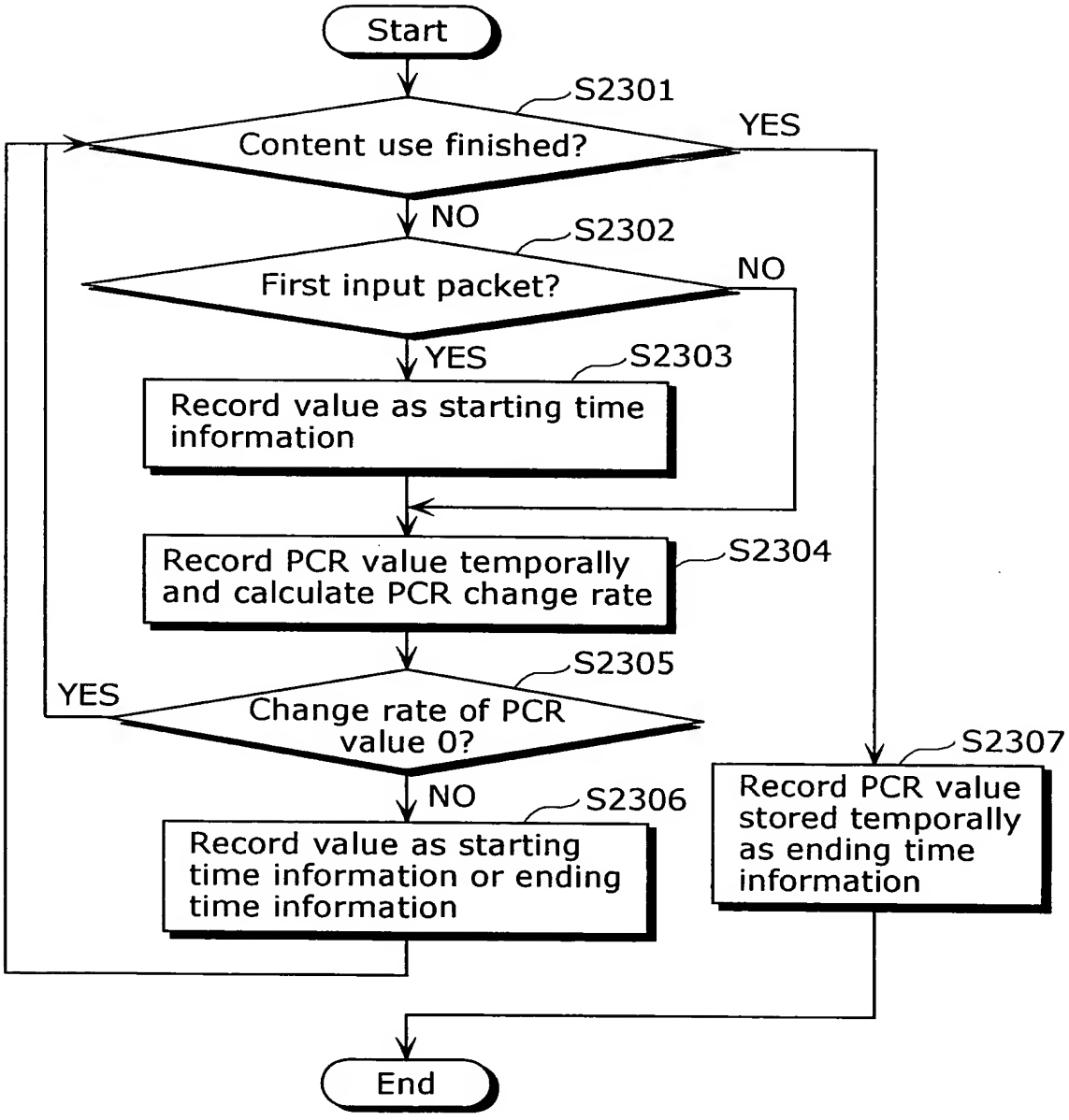

Start
S2301
Content use finished?
YES
NO
S2302
First input packet?
NO
YES
S2303
Record value as starting time information
Record PCR value temporally and calculate PCR change rate
S2304
S2305
YES
Change rate of PCR value 0?
NO
S2306
Record value as starting time information or ending time information
S2307
Record PCR value stored temporally as ending time information
End

FIG. 24

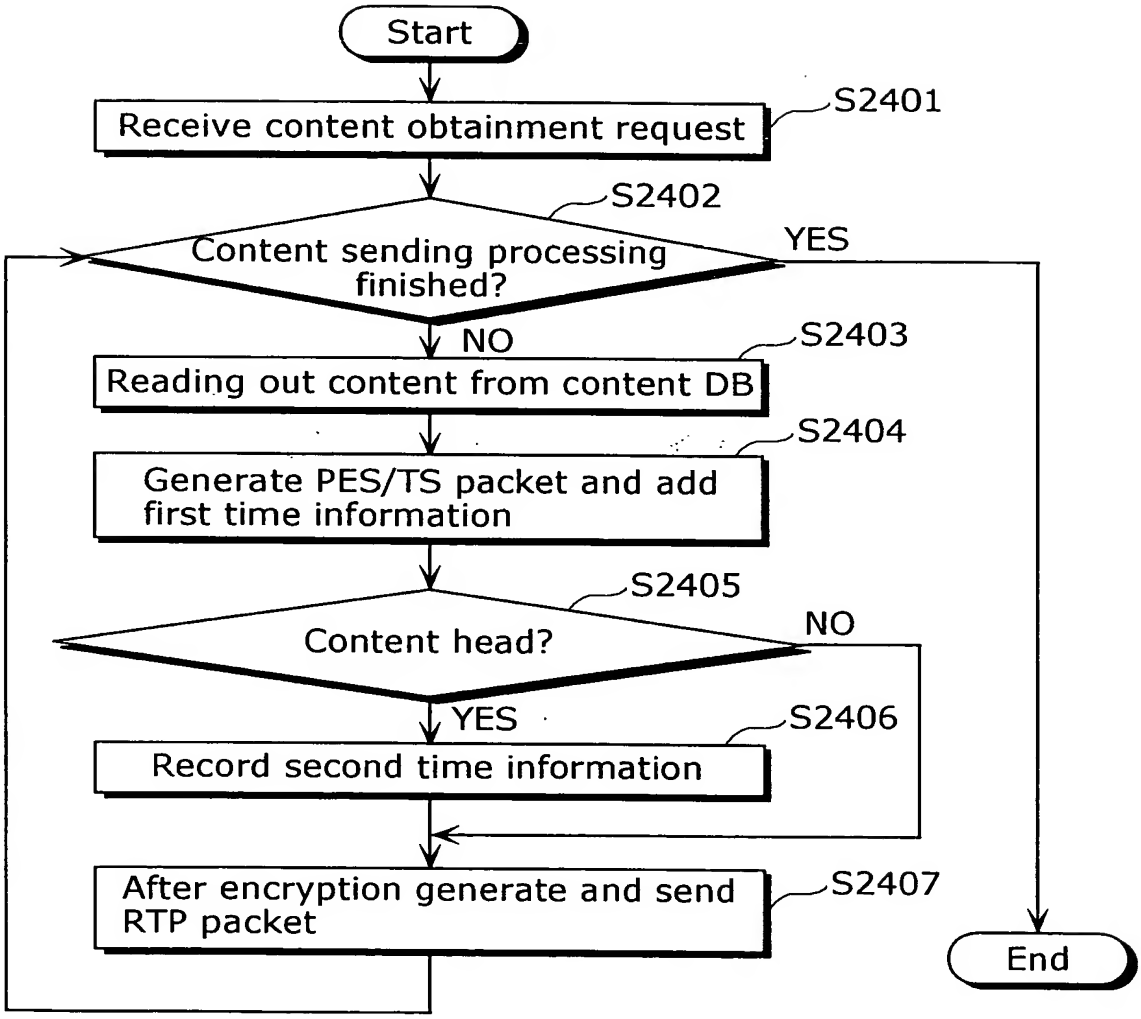

Start
Receive content obtainment request
S2401
S2402
Content sending processing finished?
YES
NO
S2403
Reading out content from content DB
S2404
Generate PES/TS packet and add first time information
S2405
Content head?
NO
YES
S2406
Record second time information
After encryption generate and send RTP packet
S2407
End

FIG. 25

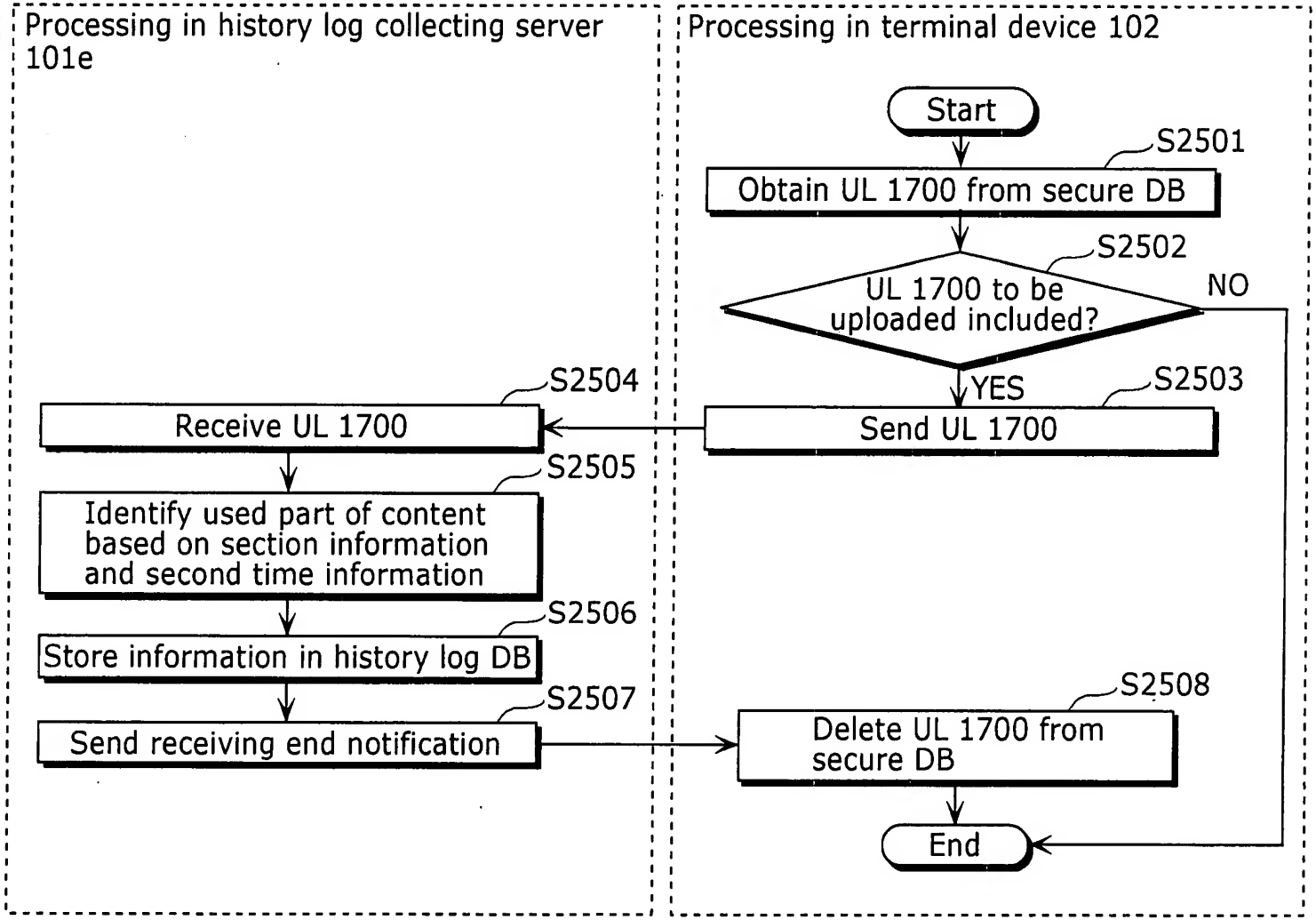

Processing in history log collecting server 101e
Processing in terminal device 102
Start
S2501
Obtain UL 1700 from secure DB
S2502
UL 1700 to be uploaded included?
NO
YES
S2503
Send UL 1700
S2504
Receive UL 1700
S2505
Identify used part of content based on section information and second time information
S2506
Store information in history log DB
S2507
Send receiving end notification
S2508
Delete UL 1700 from secure DB
End

FIG. 26

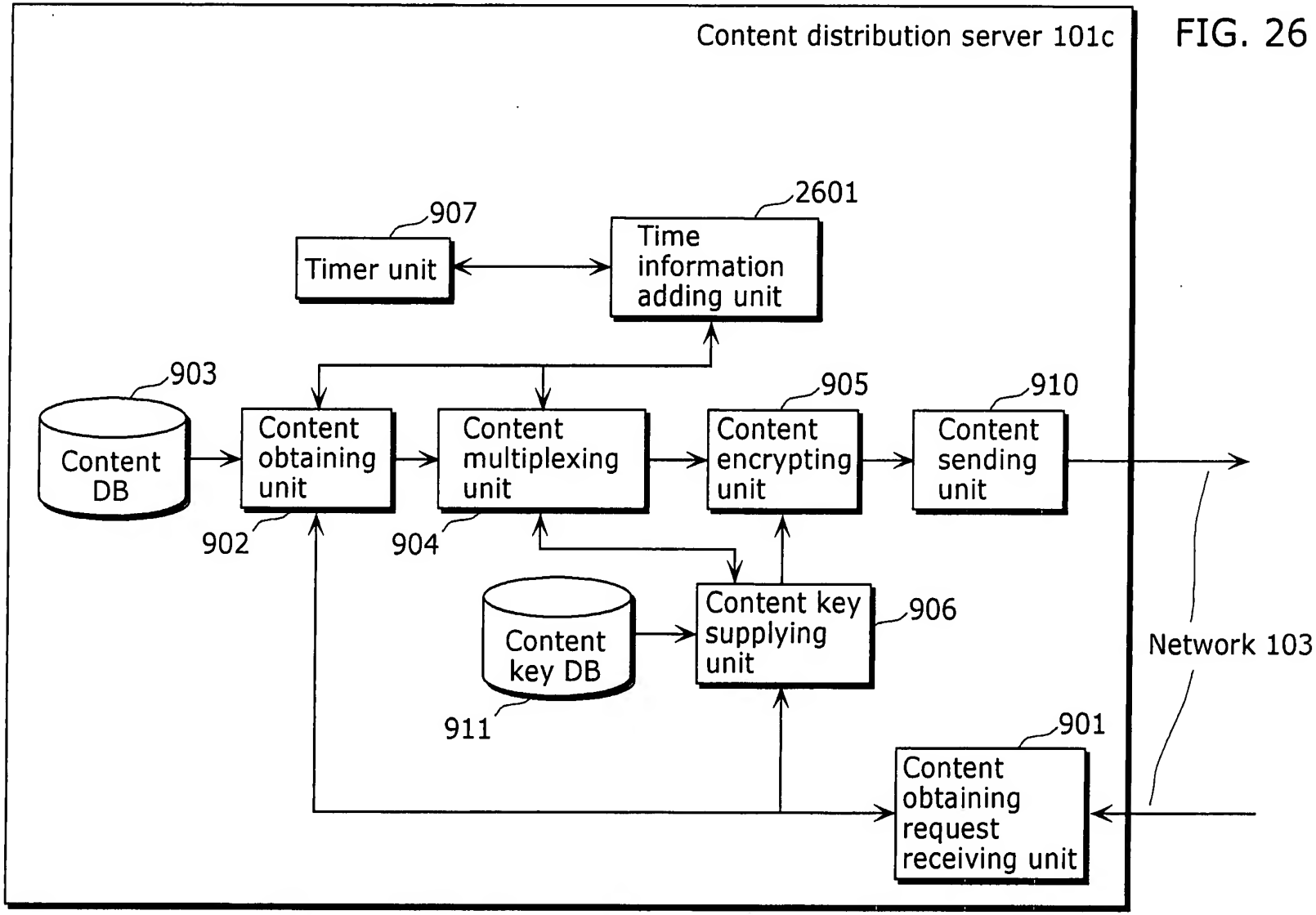

Content distribution server 101c
2601
907
Timer unit
Time information adding unit
903
905
910
Content DB
Content obtaining unit
Content multiplexing unit
Content encrypting unit
Content sending unit
902
904
Content key DB
Content key supplying unit
906
911
Network 103
901
Content obtaining request receiving unit

FIG. 27

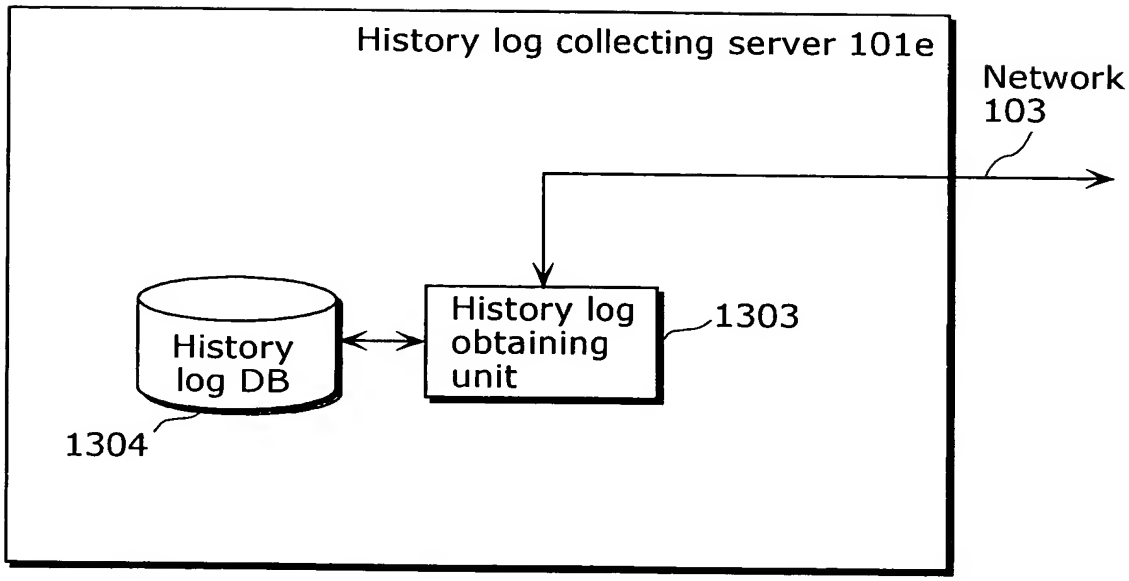

History log collecting server 101e
Network
103
History log obtaining unit
1303
History log DB
1304

FIG. 28

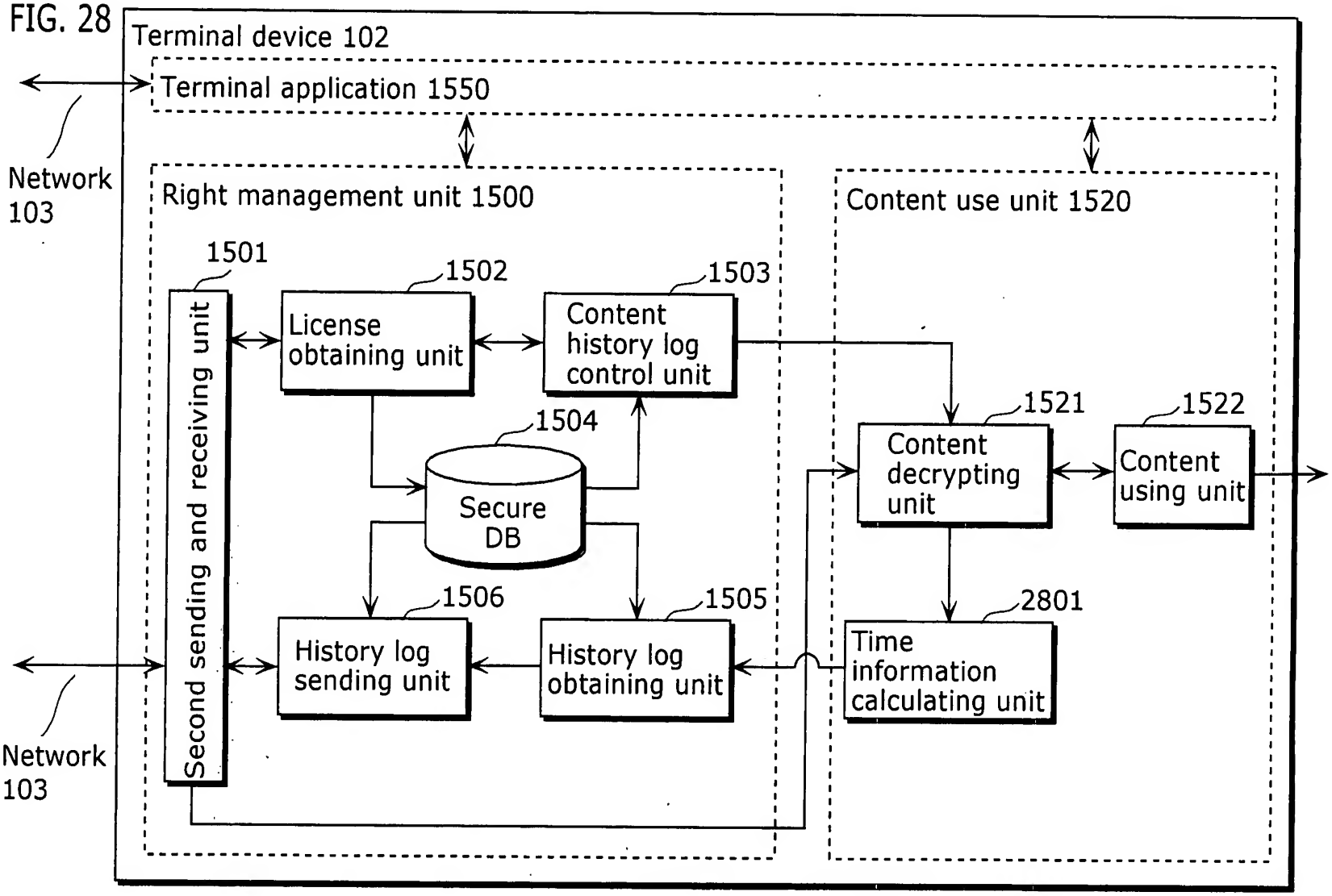

Terminal device 102
Terminal application 1550
Network 103
Right management unit 1500
Content use unit 1520
1501
1502
1503
Second sending and receiving unit
License obtaining unit
Content history log control unit
1504
Secure DB
1521
1522
Content decrypting unit
Content using unit
1506
1505
2801
History log sending unit
History log obtaining unit
Time information calculating unit
Network 103

FIG. 29

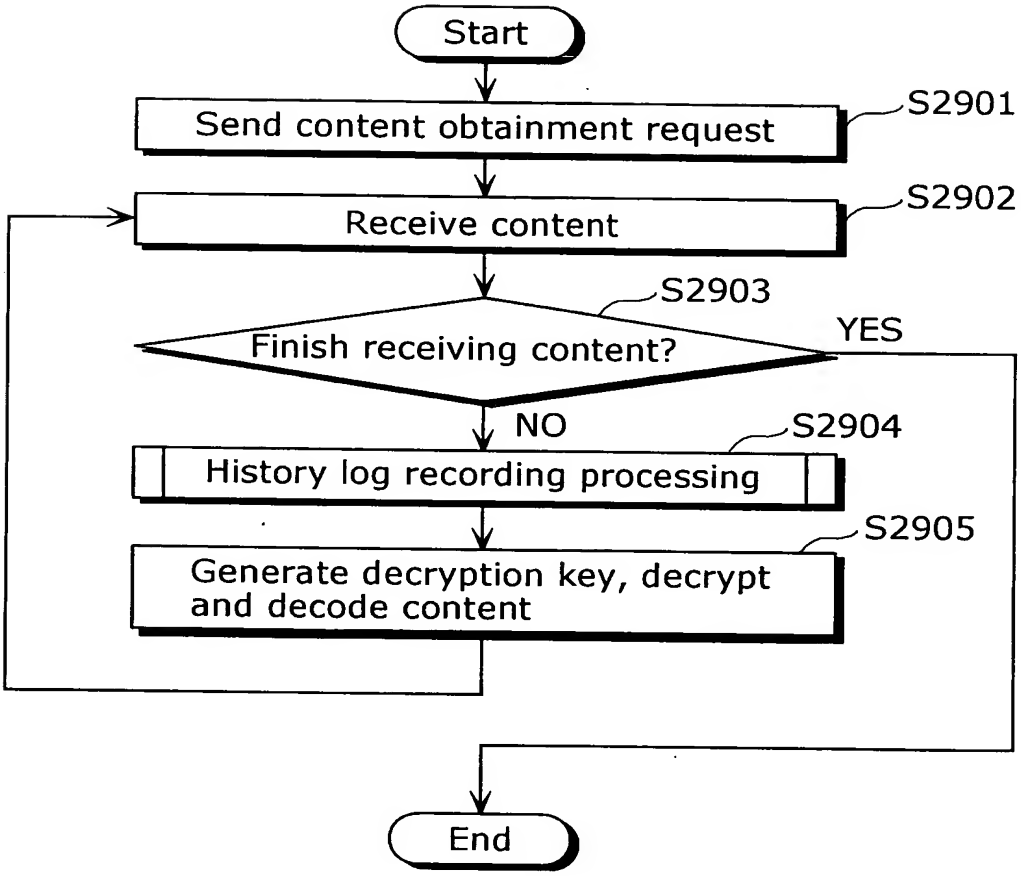

Start
Send content obtainment request
S2901
Receive content
S2902
S2903
Finish receiving content?
YES
NO
S2904
History log recording processing
S2905
Generate decryption key, decrypt and decode content
End

FIG. 30

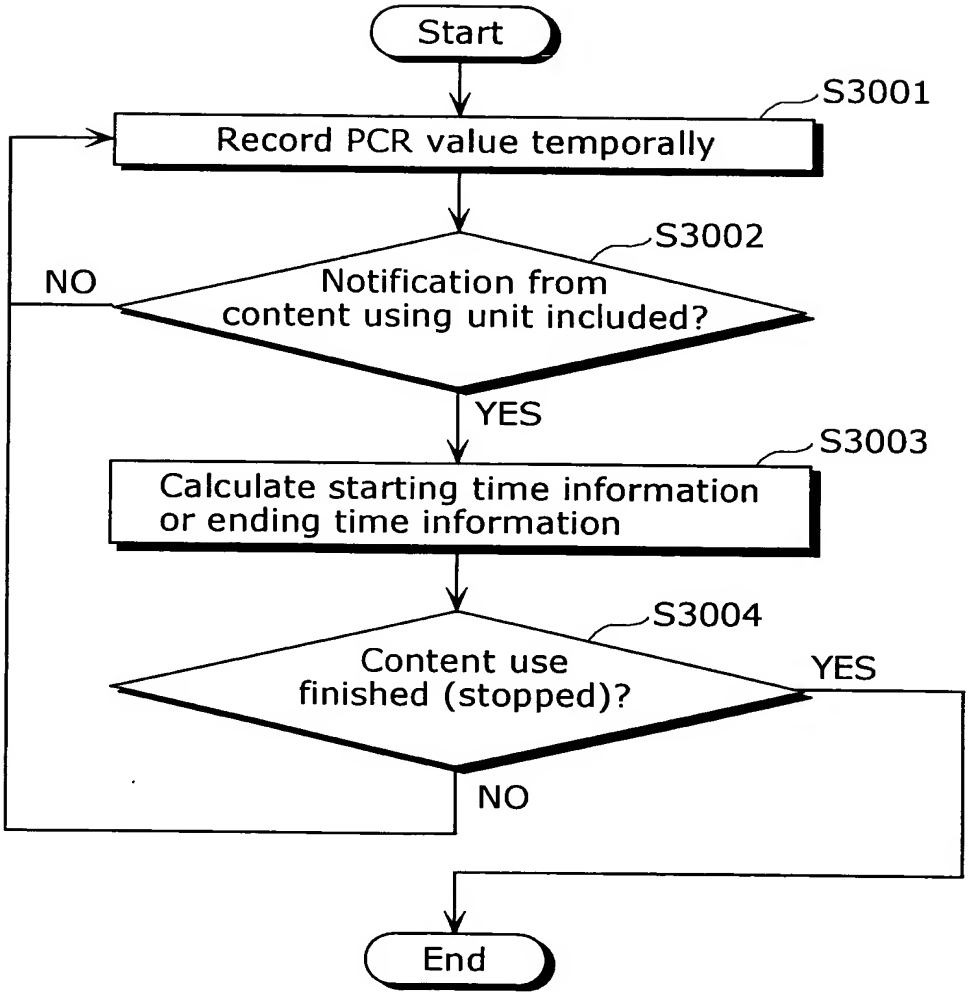
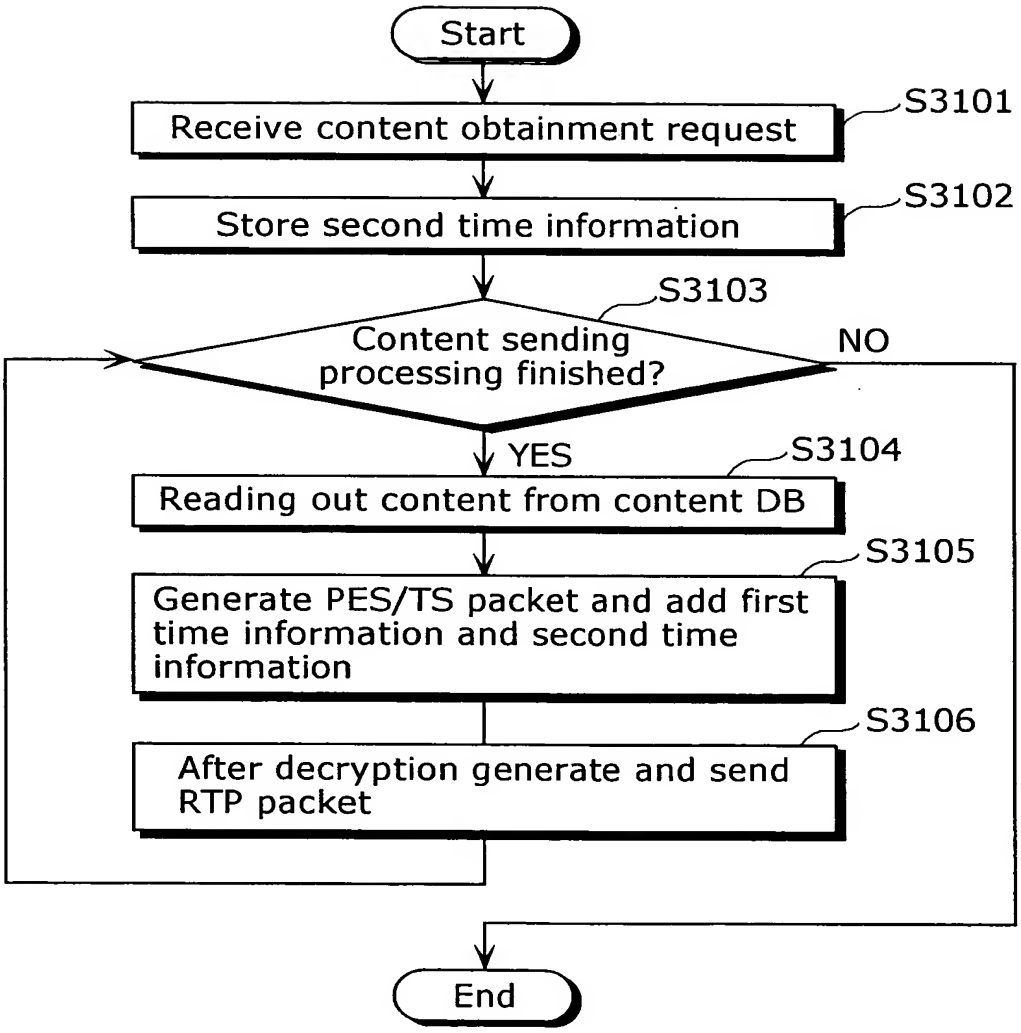

Start
S3001
Record PCR value temporally
S3002
Notification from content using unit included?
NO
YES
S3003
Calculate starting time information or ending time information
S3004
Content use finished (stopped)?
YES
NO
End

FIG. 31


Start
Receive content obtainment request
S3101
Store second time information
S3102
S3103
Content sending processing finished?
NO
YES
S3104
Reading out content from content DB
S3105
Generate PES/TS packet and add first time information and second time information
S3106
After decryption generate and send RTP packet
End